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Taxing Farmland in the United States

Gene Wunderlich
John Blackledge

Agricultural Economics & Land Ownership Survey

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Taxing Farmland in the United States. By Gene Wunderlich, Resources and Technology Division, Economic Research Service, U.S. Department of Agriculture; and John Blackledge, Bureau of the Census, Agriculture Division. Agricultural Economic Report No. 679.

Abstract

Conceptually, the ad valorem real property tax should be directly proportional to the value of the real property being taxed. However, according to the 1988 Agricultural Economics and Land Ownership Survey (AELOS), taxes paid per $100 of value of farm land and buildings declined with increases in the value of holdings. For example, landholdings valued at less than $70,000 were taxed at an average rate of $1.45 per $100 of value, while holdings of $5 million or more were taxed at 47 cents per $100. This report examines possible causes for the regressive tax rates on farm property, including State variations in tax rates, assessment bias, and landholder characteristics.

Keywords: Real property tax, landownership, farmland.

Acknowledgments

Linda Atkinson, Nelson Bills, David Chicoine, Peter DeBraal, Mark Denbaly, and Fred Stocker provided helpful reviews and suggestions. Linda Atkinson also assisted us with the regressions. John Jones composed the tables and charts, and Gertrude Butler prepared background statistics. Editing was done by Dale Simms.

Contents

Washington, DC 20005 March 1994

Farmland: The Property Tax Dimension

The real property tax bears significantly on the farming industry and agricultural communities. Nationally, an amount equivalent to one-fifth of the agricultural return to farmland is paid in real property taxes each year.

Two-thirds of the tax revenue raised by local government is from the tax on real property (fig. 1). The real property tax is an important force in landowner decisions, community land use plans, and local government budgets and services. The fairness or equity of the property tax, because it is large and because it touches all farmland owners, impinges on both land and farm policies.

State constitutions and laws provide for the equal treatment of those who pay real property taxes, or more precisely, for the equal treatment of all taxpayers in the same class (same income, same value of real estate holdings, etc.). Boards of equalization review assessments to see that taxpayers similarly situated are similarly treated. This report presents the effective rates of real property tax on specific size classes of landowners. Sizes of landholdings and taxes are expressed in acres and value. Some taxpayers are shown to pay higher rates than others, and these differences in taxes are related to States, types of owners, and characteristics of taxpayers such as age and occupation.

This report examines a number of possible reasons for the apparent regressivity of the real property tax on farmland (see box, "Regressive/Progressive Property Taxes"). Neither State differences in tax rates, preferential assessment for agriculture, nor characteristics of taxpayers fully account for regressivity in relation to the value of farm real estate. A possible explanation is the structure and administration of the tax.

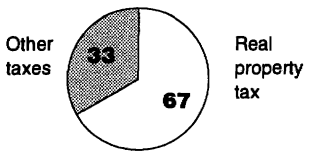
An *ad valorem* property tax should be neither regressive nor progressive, but neutral, that is, proportional to the value of the real property taxed. A tax on land value, administered evenly and without embellishments, can have a positive effect on other farm inputs, induce investments in improvements, and reduce the dependence of local governments on other, less benign, sources of revenue.

This report's analysis is based on data from the Agricultural Economics and Land Ownership Survey (AELOS, see box, p. 9). The $5.1 billion worth of taxes on agricultural land reported by AELOS amounts to less than 5 percent of U.S. real property taxes. Although this analysis is limited to agricultural land, the basic questions on the distribution of tax burden apply to other land and taxes. AELOS tax data have the virtue of bypassing the sometimes complex assessment-levy-collection process and going directly to the net effect, taxes actually paid. As such, AELOS data do not address the assessment effect, one possible factor in determining the effective property tax rates.

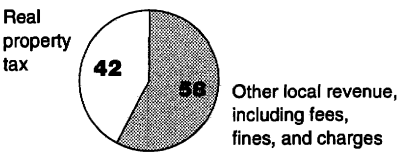
Figure 1

Real property taxes as a percentage of local revenue

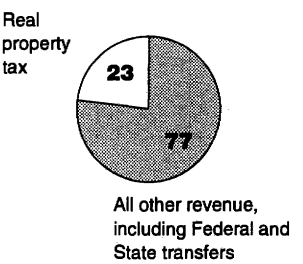
The real property tax supplies two-thirds of local tax revenue...



over 40 percent of all local revenue...



and almost a quarter of revenue from all sources.



Regressive/Progressive Property Taxes

"The most fundamental and most overlooked question is that of the base to which the tax burden is to be related." W. Vickrey (1987)

In this publication, the base of the tax is the value of the total agricultural holding of the owner. Progressive, therefore, means a higher rate of taxation on high-valued holdings of farmland; regressive means a lower rate of taxation on high-valued holdings. Data are in class of landholdings from less than $70,000 to $5 million and over of owner-estimated market value of agricultural land and buildings. The supplementary regression in the appendix uses individual estimates of value rather than class interval data.

The terms "progressive" and "regressive" have at least two other common meanings. One meaning pertains to measure of income or net worth of individuals, households, or taxpayers. Because the income tax occupies such an important place in the tax literature, progressivity is often associated with some measure of income.

The other meaning of progressivity and regressivity, more closely related to property tax, is in the appraisal or assessment of property. According to the International Association of Assessing Officers, "Appraisals are considered *regressive* if high-value properties are underappraised relative to low-value properties and *progressive* if high-value properties are relatively overappraised" (Eckert and others, 1990).

The IAAO meaning is consistent with the usage in this report. However, the issue of assessment is bypassed in this report because property tax rates are defined as property taxes paid divided by the estimated market value of the total holding of agricultural land. This procedure has the advantage of producing an estimate of the effective rate of taxation. Its disadvantage is omitting the issue of assessment bias and its causes. As a statement about the overall economic effect of the real property tax, the procedure is useful. As a critique of property tax assessment, the findings are suggestive, not conclusive.

Owners of Large Vs. Small Landholdings

The real property tax should be directly proportional to the value of the real property being taxed. However, according to AELOS, higher valued holdings of farmland pay lower taxes per $100 than lesser valued holdings.

Owners of U.S. farmland holdings valued at $5 million or more paid 47 cents per $100 of market value, whereas owners of holdings valued at less than $70,000 paid $1.45 per $100 of value (fig. 2). Value classes between these extremes show the same inverse (regressive) pattern between taxes paid and value of holdings. Taxes per acre follow the same pattern, although less consistently, as taxes per $100 of value. The $5-million-plus value-of-holding class, according to AELOS, paid $4.33 per acre, and the under-$70,000 class paid $7.97 per acre (fig. 3).

Another way of looking at tax equity is the proportionality of taxes paid to value of land held. Are the shares of taxes paid similar to the shares of land value held? The 64 percent of farmland owners in the AELOS survey who valued their holdings at less than $150,000 held 20 percent of the value of land and buildings in the survey, yet paid 27 percent of the real property taxes. On the other end of the value scale, farmland owners who estimated their holdings at $2 million or more represented less than 1 percent of the owners, held 18 percent of the value of land and buildings, and paid 10 percent of the real property taxes (table 1).

As expected, AELOS shows the tax per acre inversely related to the acreage of the holding, which follows from the higher value per acre of the small tracts. Holdings of 1-9 acres, which may include vegetable tracts, substantial buildings, and urban fringe locations, support high per-acre values, and, consequently, high tax rates per acre. Holdings of 2,000 or more acres, which may contain arid ranchland or cropland, support low values and, accordingly, low per-acre taxes. However, the different tax rates per acre associated with landholding size do not explain the regressive tax rates in terms of the value of holdings.

In theory at least, the *ad valorem* tax should be directly and neutrally related to the value of the property holding. Large estates may consist of large amounts of low-valued land. However, the average value per acre of estates $2 million and over is $830, while the per-acre value of estates under $150,000 is $700. The *ad valorem* principle suggests that tax rates per acre should be lower on the small owners, but AELOS shows the reverse. In addition, AELOS shows a lower rate of taxation per $100 of owner-estimated market value on large holdings than on small holdings.

One plausible explanation for the relatively light taxation of large landholdings may be what the International Association of Assessing Officers (IAAO) terms appraisal or assessment bias (Eckert and others, 1990). The IAAO refers to a systematic overappraisal of low-valued properties and underappraisal of high-valued properties. AELOS offers no specific evidence on appraisal bias. In AELOS, each owner reported total amount of real property taxes paid, the acreage on which the taxes were paid, and his or her estimated market value of the holding. AELOS did not report assessed values. Nor did AELOS report the abundance of exemptions, deferments, and credits in the legislation and administration of the 50 States and their local jurisdictions. AELOS data show the net effects of taxation on farmland owners, namely that large holdings (in terms of value) are taxed at a lower rate than smaller holdings.

Figure 2

Real property taxes per $100 of value, 1988

Owners in the top class of landholdings ($5 million or more) pay tax rates about one-third of rates on owners in the bottom class.

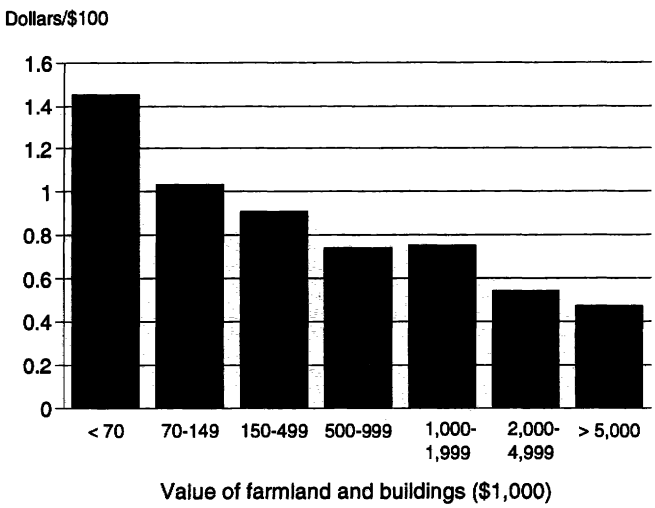


Figure 3

Real property taxes per acre, 1988

Taxes per acre follow the same general pattern as taxes per $100.

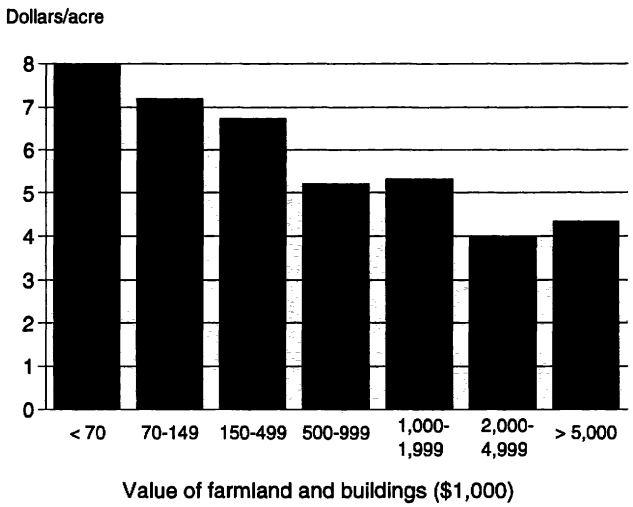


Table 1--Percentage of farmland owners, acreage, value, and taxes by value of land and buildings, 1988

Value of land and buildings	Owners	Acreage	Value	Property tax
		Percent		
Less than $70,000	36.3	8.1	6.2	10.7
$70,000-$149,999	27.5	14.1	13.6	16.7
$150,000-$499,999	28.2	34.0	34.8	37.6
$500,000-$999,999	5.3	17.4	16.9	14.9
$1,000,000-$1,999,999	1.7	11.0	10.8	9.7
$2,000,000-$4,999,999	0.6	8.0	8.2	5.2
$5,000,000 or more	0.2	7.3	9.4	5.2

State Variations in Tax Rates

States vary widely in their reliance on, and rates of, real property taxation. Agricultural land receives preferential treatment in all 50 States but the nature and level of the preference differs widely.

Variations in State taxes on real property depend upon the level of services demanded from the State and local jurisdictions, other sources of revenue, and the value of the real property base. Important to the tax on a parcel of land are the State's appraisal, assessment, and rate. The effective rate of taxation will also vary by special treatment of various classes of land (such as farm or open land) or classes of people (such as low-income or elderly).

In Michigan, the real property tax on farmland as reported by AELOS was $21.31 per acre and $2.14 per $100 of market value; in Alabama, farmland taxes were $2.63 per acre and 31 cents per $100 of market value (fig. 4, 5). These effective tax rates reflect the tax bill on agricultural land, not necessarily the final incidence of the tax; subsequent refunds, "circuit breakers," and deductions on income tax can greatly alter the final incidence of the property tax. Refunds and deductions may be capitalized into farmland values (Anderson, 1993), and thus affect rates and the distribution of taxes.

Farmland receives preferential assessment in all States in a variety of forms. Nineteen States assess land at its value in agricultural use so long as it remains in agricultural use. Other States defer taxation at full-value assessment and then impose a rollback penalty when the land is converted out of agricultural use. Some States also impose additional restrictions in exchange for preferential assessment (Aiken, 1989).

Preferential assessments for agricultural land may increase the return to farmland and, thus, its capitalized value. The higher values, in turn, will raise the tax base and taxes so that the net return, after taxes, to farming will become what they would have been without the preferential assessment.

Prices of farmland in the presence of urban development are high relative to their return from farming. In the Northeast, for example, prices, and therefore the assessed values, for farmland are strongly influenced by urban pressures. The returns to farmland, as measured by cash rents in the Northeast, are completely absorbed by real property taxes. Farmland in Corn Belt States, by comparison, nets a return of 4-7 percent after taxes (appendix table 1). For the Nation overall, about one-fifth of the agricultural return to agricultural land goes to real property taxes, but the proportions vary widely.

If States paid real property taxes to one national pool in proportion to their share of farmland value, the shares of taxes would differ sharply from those revealed by AELOS. According to AELOS, Texas held almost 12 percent of the Nation's value of farm land and buildings, and paid only 8 percent of the taxes on farm land and buildings. Iowa, with only 5 percent of the Nation's farmland value, also paid about 8 percent of the taxes (appendix table 2). State proportions of the Nation's tax bill reveal differences in effective tax rates among States, even among States with widely differing dollar amounts of agricultural land. Some States such as Illinois, Texas, California, and Iowa contain a large share of U.S. farmland value. Others, such as the New England States, contain a small share.

In most States, the share of value in the class of largest owners ($5 million or more) exceeded the share of taxes paid by that class of owners. In 26 States, the share of value in the class of largest owners exceeded the share of taxes by more than 50 percent. Nationally, the class of owners with holdings of $5 million or more held 9.4 percent of farmland value and paid 5.2 percent of taxes.

Figure 4

Farm real estate taxes per acre, 1988

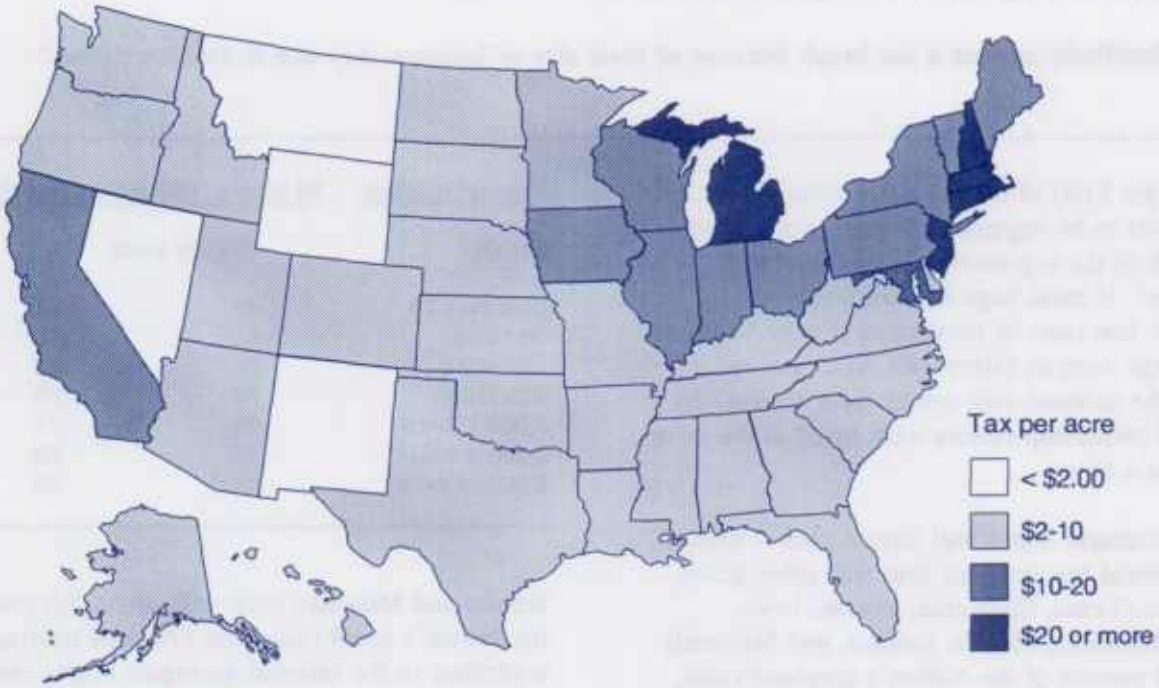
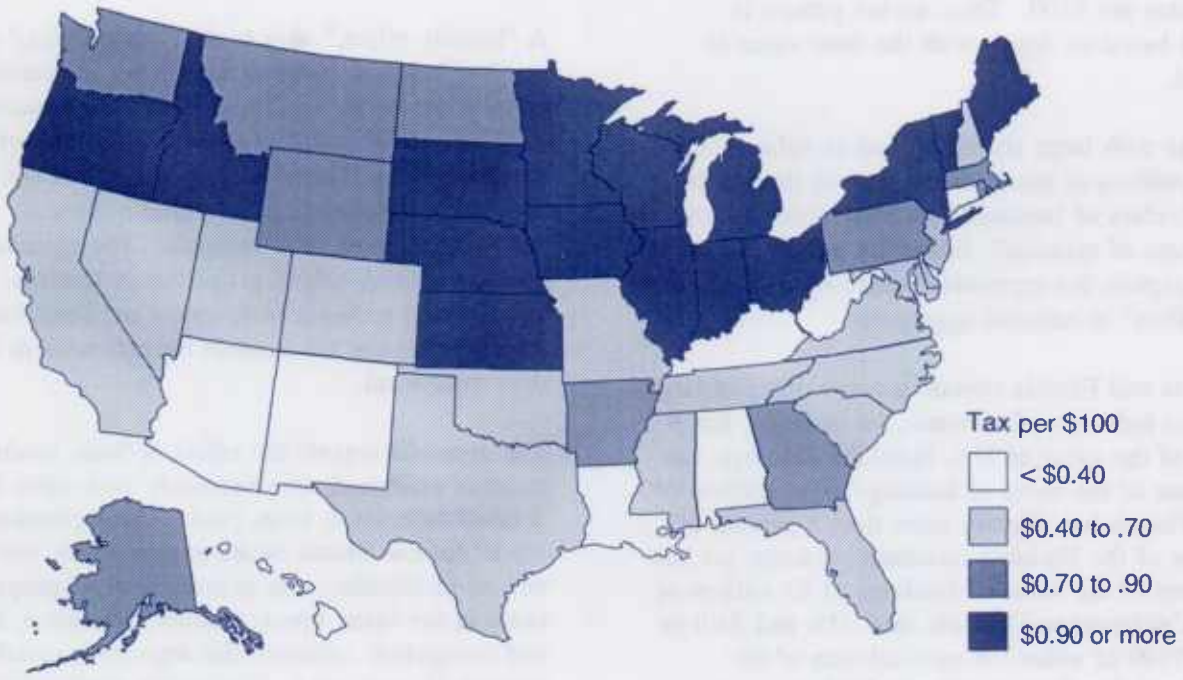


Figure 5

Farm real estate taxes per $100 of market value, 1988



State Landholding and Taxing Patterns

Do large landholdings get a tax break because of their size or because they are in low-tax States?

Tax rates per $100 of market value were shown by AELOS data to be regressive at the national level. How much of the regressivity is due to State differences? If most large landholdings were in States with low rates of taxation or if most small landholdings were in States with high rates of taxation, the national data would show regressivity even if all ownership classes were taxed at the same rate **within** a State.

Large agricultural States will have a greater impact on the national tax averages than will other States. Nine States (Texas, California, Illinois, Iowa, Kansas, Minnesota, Florida, Indiana, and Missouri) contain 49 percent of the Nation's farmland value, and pay 46 percent of taxes on agricultural land (appendix table 2). Of these States, California, Florida, and Missouri ranked in the lower half of State tax rates in tax per $100 of value. Texas, first in total value of farmland, ranked 29th in tax per $100. The other five States ranked in the upper half of tax rates per $100. Thus, no tax pattern is apparent based on States with the most value in farmland.

Do States with large shares of land or value in the top ($5 million or more) or the bottom (less than $70,000) class of landholdings have relatively low (high) rates of taxation? Either tax pattern would help to explain the regressive nature of tax rates as a "State effect" in national aggregates.

California and Florida contain a major share of large (in value) holdings. California, for example, has 8 percent of the value of U.S. farmland holdings, but 23 percent of the value of holdings of $5 million or more. Florida has slightly more than 3 percent of the value of the Nation's farmland holdings, yet has 16 percent of the value of holdings of $5 million or more. California and Florida rank 31st and 34th in tax per $100 of value. A recalculation of the national tax distribution without California and Florida shows the effects of their highly valued landholdings and moderately low tax rates.

Value of holdings	All States	Without CA and FL
$1,000	*Tax per $100*	
Less than 70	1.45	1.46
70-149.9	1.03	1.03
150-499.9	.91	.92
500-999.9	.74	.76
1,000-1,999.9	.75	.77
2,000-4,999.9	.54	.56
5,000 or more	.47	.53

Kansas and Missouri, each with about 5.5 percent of the Nation's small (less than $70,000) holdings, contribute to the national aggregate regressivity, but neither is large enough to be a "State effect." On the contrary, in **every** State, the share of taxes paid by the small holdings class is greater than its share of farmland and building value. Smallholdings appear to pay a disproportionate share of property taxes in all States.

A "locality effect," akin to the "State effect," could result if large (in value) holdings are concentrated in counties or towns which, by lower assessments or rates, effectively tax less than jurisdictions with small holdings. Local jurisdictions, however, must administer the property tax within a State's constitution, laws, and oversight. The systematic location of high-valued properties in low-tax jurisdictions within a State seems unlikely, but AELOS data are not suitable for estimates at lower than State-level.

The appendix reports the effect of State levels of taxation examined simultaneously with other factors deemed relevant to taxes paid. The regression model for the United States explains how the value size of landholding, the general level of property taxes in the State, operator status, residence, race, and occupation influence the dependent variable, amount of taxes paid. The results confirm that taxes on high-valued properties are proportionately less than on low-valued properties. That is, the real

property tax on agricultural land is regressive in the sense that high-valued properties pay a lower effective rate of taxation than low-valued properties.

Clearly, real property tax rates differ among States, so the tax bill on any particular property will be related to the State in which it is located. To show more clearly the relationship between tax rates and size of holding, separate regressions were run for each State. In only four States were the effective rates of real property taxes progressive. In five more States, the rates were neutral or slightly regressive. In the remaining States, the rates were moderately to steeply regressive. Patterns vary widely but, in general, other factors such as age and occupation appear to have less bearing on the rate of taxation than the value of the property does.

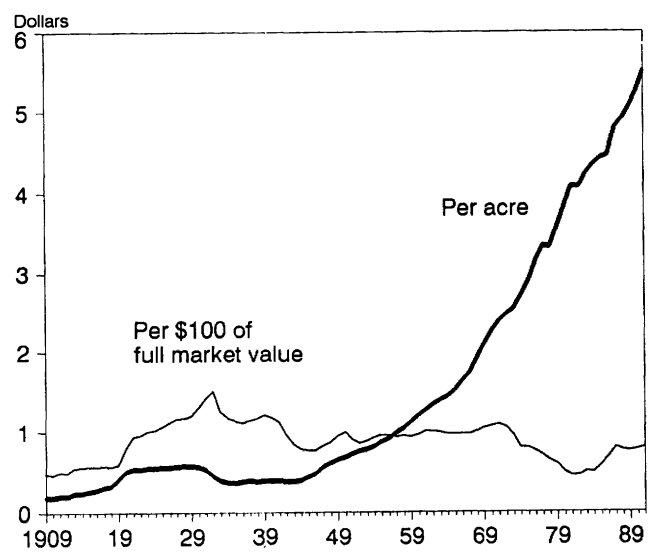
AELOS and ARET

The U.S. Department of Agriculture, through the Economic Research Service and its predecessor agencies, has reported annual estimates of agricultural real estate taxes (ARET) since 1909. The USDA State and national estimates are of (1) total taxes levied on agricultural land, (2) taxes levied per acre, and (3) taxes per $100 of market value. In 1988, USDA estimates were $4.3 billion for total taxes, $4.92 for taxes levied per acre, and 77 cents for taxes levied per $100 of value. Comparable figures for 1991, the most recent estimates available, are $4.8 billion in total taxes, $5.51 per acre, and 80 cents per $100. USDA tax data are collected from local (mostly county) revenue officials. The local official, with instructions, selects from the tax roles a sample of farmland parcels. Local samples of farmland parcels, taxes levied, and acreages are assembled, weighted by size, and combined to form State estimates. Market value of farmland, with which the tax estimates are compared, are taken from another series, separately calculated. For time series, see Debraal, 1993.

By contrast, AELOS tax estimates are derived from a sample of responses by owners of census-defined land in farms. Owners report for their farmland the taxes paid, acreage, and estimated market value. The 1988 AELOS omitted horticultural and abnormal farms and some farms whose ownership changed in 1988. The result was a sample slightly smaller than the Census of Agriculture. AELOS estimates of the U.S. level of taxes were $6.08 per acre and 85 cents per $100 of owner-estimated value (U.S. Dept. Commerce, 1990).

USDA and AELOS methods of estimation, and the samples from which estimates are made, are substantially dissimilar. Because terms such as "farmland" and "agricultural" seem to be equivalent, one may be tempted to compare, for example, AELOS's estimated tax of $6.08 per acre with USDA's $4.92. The temptation should be resisted. AELOS is best for analyzing factors affecting the real property tax paid, as reported by taxpayers. USDA estimates track trends in real property taxes levied, according to tax officials.

ARET, 1909-91



Farm Operator and Nonoperator Owners

Owners who are not farm operators paid taxes at a higher rate than did farm operators. At 92 cents per $100 of market value, the tax rate of nonoperator owners was about 16 percent greater than the rates of operator owners.

Both farm operators and nonoperator owners of farmland have substantial holdings and pay substantial taxes. Operators hold 62 percent of land value and pay 58 percent of the property taxes on agricultural land; nonoperators hold 38 percent of land value and pay 42 percent of taxes (fig. 6, table 2). Taxes per $100 of value differ between farm operators and nonoperators not only by overall averages but by composition of rates over value of holding. Tax rates for operators decline on a regular gradient as value of holding increases; for nonoperators, rates decline in an irregular pattern after the high rates on small holdings.

AELOS reported that nonoperators paid higher taxes per $100 of market value than did farm operators in 24 States, lower taxes per $100 in 24 States, and exactly the same in 2 States--an even split. In 31 States, the rate of taxes per $100 for farm operators and nonoperators differed by more than 10 percent.

In most regions, the pattern of tax rate differences between operators and nonoperators was mixed. However, in the Northeast, farm operators paid higher rates than did nonoperators in every State but Maine and Vermont. New Hampshire operators were taxed at rates averaging more than three times the rates of nonoperators. In the South, nonoperators had higher tax rates than did operators in all States except Kentucky, Louisiana, and Arkansas. In Arkansas, tax rates on farmland held by farm operators were reported at 166 percent of tax rates on farmland held by nonoperators (appendix table 3).

Why do tax rates on farmland held by owner-operators and nonoperators differ? Perhaps the most apparent answer is that the type of real property held by farm operators and nonoperators differs. The differences, if any, would have to affect assessment or levying of taxes without a similar effect on the value of property taxed. For example, if homesteads are exempt from tax, but are included in the reported value of farm land and buildings, then the tax rate would be lower than on the same holdings without the homestead exemption. Farm operators are more likely to be eligible for homestead exemption than are nonoperator owners, in part because farm operators are more likely to live on the farm. There are 17 States with total or partial exemption for homesteads, most of which have relatively low rates of property taxes regardless of the exemption. The "homestead effect" is weak, if it exists at all; owners residing on their land pay slightly higher taxes per acre and per $100 of value than owners not residing on their land (U.S. Dept. of Commerce, 1989a).

The form of preferential assessment, as outlined by Aiken (1989), also appears unrelated to the pattern of tax rates for farm operator owners and nonoperators. Some States with more restrictive features have higher rates for operators, while others have higher rates for nonoperators.

Residence on the farm appears to account for substantial differences in taxes per acre and also some difference in taxes per $100 of value. The tax-per-acre rate differences may reflect the presence of buildings, hence higher taxes, by onfarm residents and the lack of buildings on land owned by "not-on-farm" residents. Differences become even more visible when operators are separated from nonoperators.

Residence	Tax per acre			Tax per $100 of value		
	All owners	Operators	Nonoperators	All owners	Operators	Nonoperators
			Dollars			
On farm	7.13	6.87	8.03	0.87	0.85	0.96
Not on farm	5.38	4.33	5.89	.81	.61	.91

Figure 6

Percentage of owners, acres and value of land owned, and taxes paid by operators and nonoperators

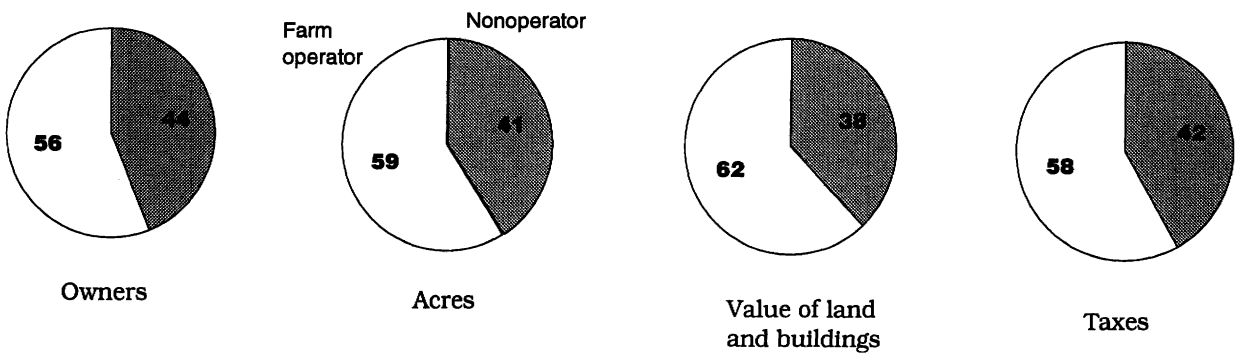


Table 2--Average acres, average value, and tax rates for operator and nonoperator owners, 1988

Value of land and buildings	Average acres		Value per acre		Tax rate per acre		Tax rate per $100	
	Owner operator	Nonoperator	Owner operator	Nonoperator	Owner operator	Nonoperator	Owner operator	Nonoperator
	Acres		*Dollars*					
United States	299	261	754	675	5.98	6.20	0.79	0.92
Less than $70,000	63	62	591	510	7.15	8.69	1.21	1.70
$70,000-$149,999	137	159	738	642	7.24	7.11	0.98	1.11
$150,000-$499,999	340	341	744	731	6.77	6.61	0.91	0.90
$500,000-$999,999	872	1,031	738	652	5.50	4.78	0.75	0.73
$1,000,000-$1,999,999	1,815	1,910	710	703	4.78	6.27	0.67	0.89
$2,000,000-$4,999,999	3,453	4,567	806	614	4.14	3.63	0.51	0.59
$5,000,000 or more	10,920	12,943	1,067	795	3.75	4.91	0.35	0.62

Taxpayer Characteristics

AELOS reported some differences in taxes paid per acre and per $100 of value by age, race, and occupation of farmland owners. These differences were clarified by further distinguishing farm operator and nonoperator owners.

The elderly own a substantial portion of U.S. farmland. Owners 65 and older hold 40 percent of the acreage and 37 percent of the value of farmland held by individual and partnership (noncorporate) owners. They constitute 37 percent of the owners and they pay 38 percent of the real property taxes on U.S. farmland. Figures 7 and 8 and table 3 show that rates of taxation descend over age for farm operator owners and ascend for nonoperators. The offsetting gradients produce an all-owner distribution of rates by age that is nearly uniform. Nonoperators aged 70 and older pay the highest tax rate of all age classes. The taxes and values reported do not take into account possible rebates or income tax offsets so the final incidence of the tax is not certain. However, it is difficult to explain away at least some relation of tax rates to age, in opposite directions for operators and nonoperators.

Any relation between race and property tax is overwhelmed by the racial distribution of farmland ownership; more than 97 percent of owners are white. The predominant nonwhite landowner group, black landowners, holds slightly more than 1 percent of U.S. farmland, according to AELOS. The tax rate for nonwhite nonoperator owners, at 89 cents per $100, is below the white nonoperator tax rate of 95 cents, but the nonwhite operator rates (94 cents) are above the white operator rates (80 cents). Perhaps because of some concentration in specialty and higher valued agricultural production, nonwhite owners hold higher valued land and pay higher taxes per acre than do white owners. However, nonwhite owners also pay higher taxes per $100 of value, although the difference is less than on a per-acre basis. The disparities in landownership, regionality, and differences in types of agriculture cloud any conclusions about difference in real property taxes attributable to race.

The gender data on farm operator owners were derived from the 1987 Census of Agriculture and, as such, are not strictly comparable with AELOS. Thus, gender as a characteristic of taxpayers is really appropriate only for nonoperators, 41 percent of whom are women. Women nonoperator owners hold 39 percent of the acreage and 35 percent of the value of farmland; they pay 35 percent of the real property taxes. Males represent 31 percent of nonoperator owners, and 28 percent of the acreage, value, and taxes. Joint ownerships represent the remaining shares. Gender appears to have no important effect on the rates of taxation.

The occupation of farmland owners provides an insight into the structure of agriculture and its resource owners. Twice as many farmland owners reported their principal occupation as other-than-farming than as farming. Over 66 percent of the individual and partnership owners, holding 49 percent of the acreage and 55 percent of the value of farmland, identified their principal occupation as other-than-farming. More than half, 53 percent, of the real property taxes are paid by owners whose principal occupation is not farming.

The implication of the large proportion of landowners with nonfarm occupations, including retirement, is that agriculture draws on the resources of, and pays out income to, a much larger community than farm operators. Income flows from some farm communities to other communities and States where landowners work and reside; investments and real property taxes flow from landowners to the communities where the farmland is located. Thus, the effects of fluctuations in farm income and in the value of farm assets may be partially absorbed by, or compounded by, other sectors of the economy.

Figure 7

Taxes per acre of farmland, by age, 1988

Operator owners aged 35-44 pay the highest tax per acre of all age groups.

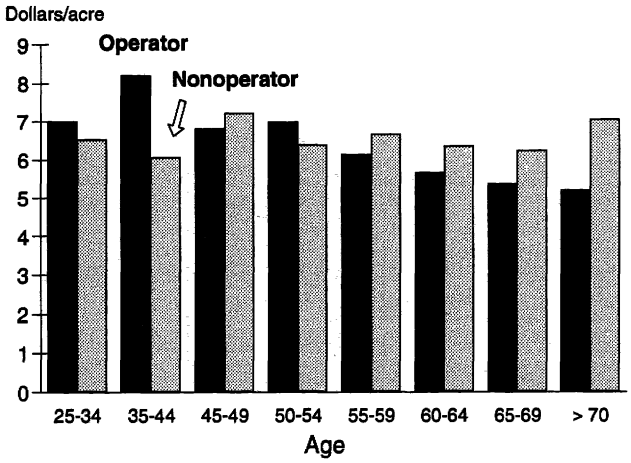


Figure 8

Taxes per $100 value of farmland, by age, 1988

Tax rates generally descend over age for operator owners and ascend for nonoperators.

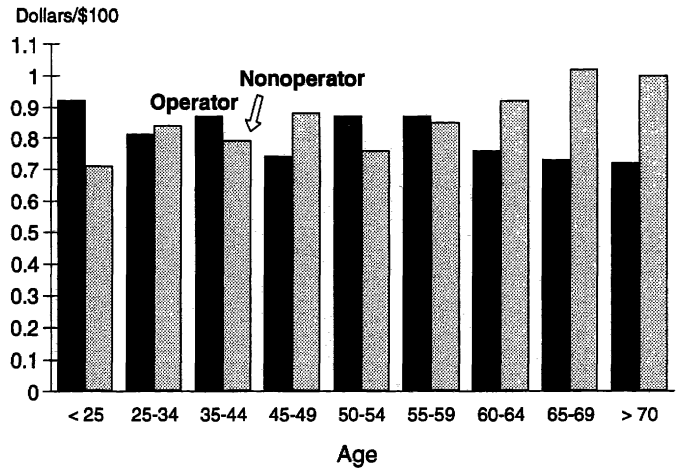


Table 3--Tax rates and percentage of owners, acres, value, and taxes by age, 1988

Age	Tax per acre	Tax per $100	Share of Owners	Share of Acres	Share of Value	Share of Taxes
	---Dollars---		*----------Percent----------*			
All owners:						
Under 25	5.17	0.84	0.7	0.5	0.4	0.4
25-34	6.86	0.81	6.2	3.9	4.4	4.2
35-44	7.65	0.85	13.5	10.0	11.9	11.9
45-49	6.84	0.76	9.0	7.8	9.3	8.3
50-54	6.78	0.83	9.8	10.6	11.4	11.2
55-59	6.21	0.85	11.8	12.6	12.1	12.2
60-64	5.83	0.81	12.1	14.7	14.0	13.3
65-69	5.72	0.85	11.8	14.2	12.6	12.6
70 or over	6.52	0.91	25.2	25.6	24.0	25.9
Owner-operators:						
Under 25	5.48	0.92	0.8	0.5	0.4	0.4
25-34	7.00	0.81	8.9	5.3	5.8	5.9
35-44	8.20	0.87	17.7	12.5	14.9	16.3
45-49	6.81	0.74	11.5	10.1	11.9	11.0
50-54	6.99	0.87	11.9	12.9	13.2	14.4
55-59	6.12	0.87	13.2	15.0	13.5	14.6
60-64	5.64	0.76	12.4	15.9	14.9	14.3
65-69	5.36	0.73	10.2	12.5	11.6	10.6
70 or over	5.19	0.72	13.4	15.2	13.9	12.6
Nonoperator-owners:						
Under 25	4.58	0.70	0.6	0.4	0.4	0.3
25-34	6.39	0.83	2.6	1.8	1.9	1.7
35-44	5.95	0.77	7.9	6.1	6.6	5.4
45-49	7.08	0.86	5.7	4.1	4.7	4.3
50-54	6.25	0.74	6.9	7.0	8.2	6.5
55-59	6.53	0.83	9.9	8.8	9.6	8.6
60-64	6.22	0.91	11.7	12.8	12.4	12.0
65-69	6.12	1.00	13.9	17.0	14.5	15.6
70 or over	7.23	1.02	40.9	42.1	41.7	45.6

Uniformity and Equality in Taxation

Newhouse (1984), in his study of equality and uniformity in State taxation, named 12 classes of equality. Although 42 State constitutions contain explicit "uniformity clauses," he cautioned against generalizations about the nature of the equality. Complex constitutional structures, he said, sometimes obscure the net effect of State provisions.

The U.S. Constitution provides a "floor" of equal protection in its 14th amendment, which Newhouse calls "truly a minimal standard." A few landmark cases affirm the minimal role of the Federal law in specifying and determining equality in property taxation: Bell's Gap Railroad Co. v. Pennsylvania (1890), Pollock v. Farmers' Loan and Trust Co. (1895), Allied Stores of Ohio v. Bowers (1959). The Federal equal protection clause provides some ultimate protection against unreasonable classifications, but the substance of uniformity and equality rests with State constitutions and laws. Nordlinger v. Hahn (1992) seems only to emphasize the Federal impotence in preventing wide differences in the effective rates of property taxation possible under State law (Behrens, 1992).

This report, based on AELOS data, bypasses assessment, levy, and equalization processes and goes directly to taxes paid per acre and per $100 of value as stated by the landowner. The rates are "effective" rates of taxation. Equality or inequality is defined by differences in the rates of taxes paid on seven classes of farmland value. While the measures employed here are useful in their directness and simplicity, they do not measure all aspects of uniformity or equality. The burden of the tax on farmland holdings does not necessarily equal the burden on all of the owner's assets or the owner's income. The property taxes paid on farmland do not necessarily reflect their final incidence, which may include special treatments or exemptions rebated after the tax is paid.

For farmland, the notable deviation from *ad valorem* uniformity results from assessing agricultural land in agricultural use rather than at a (higher) market value from another potential use. Agricultural use value assessment is a subsidy for maintaining the current agricultural use. In 19 States, the taxpayer receives a preferential treatment for agricultural land use so long as it is in place; in the other States, some penalty for land use conversion is invoked, usually as a rollback of new higher rates for a number of years.

Do the preferential tax procedures influence the rates of taxation as reported in AELOS? Of the 19 States with a purely preferential treatment (no rollback) of agricultural land use, 9 had tax rates per $100 of value below the midpoint of rates (69 cents), and 10 had tax rates above the midpoint. The relation between preferential assessment and tax rates of the States is not obvious. Still, taxpayers with large landholdings may better, or more frequently, qualify for preferential assessment and thereby pay lower taxes per $100 than taxpayers with small landholdings.

The relation of real property taxes to Federal and other State taxes will also affect the final incidence of the tax. The Federal/State tax system may cause distributional transfers among landowning groups. For example, property taxes can be deducted as an expense under Federal income tax statutes. Because the Federal income tax is progressive, the value of the deduction is greater for high-income landowners than for low-income landowners. AELOS does not report directly the total or taxable income of the landowners. Therefore, the regressivity associated with value of the landholding does not necessarily extend to gross or net income.

Federal income taxes are levied in progressive brackets of 15, 28, and 31 percent of taxable income. To illustrate the effect of deducting the real property tax from the income tax, these income tax brackets are chosen to compound differences among small, middle, and large landholdings:

Value of holding	Taxes per $100 of value	Income tax adjustment	Effective taxes per $100 of value
$1,000	*Dollars*	*Percent*	*Dollars*
< 70	1.45	0	1.45
70-149	1.03	15	.88
150-499	.91	15	.77
500-999	.74	28	.53
1,000-1,999	.75	28	.54
2,000-4,999	.54	31	.37
5,000 +	.47	31	.32

A deduction on a tax is equivalent to a rebate. Deducting real property taxes as an expense on the progressive income tax has the effect of increasing the regressivity of the property tax. The actual effects would be determined by the income tax rates incurred by landowners in each of the landholding groups.

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Appendix: A Property Tax Model

The apparent regressiveness of the real property tax on agricultural land for the United States as a whole is partially, but far from fully, accounted for by State differences in tax rates. Other factors were considered in the text. These same factors were examined together in a regression equation, $P = (X_1, \ldots X_n)$, where P = $taxes paid and:

X_1 = $value of land & buildings owned
X_2 = State average tax $/$100 market value
X_3 = Age of owner
X_4 = Operator (1), Nonoperator (0)
X_5 = Race: White (1), All other (0)
X_6 = Occupation: Farming (1) Other (0)
X_7 = Residence: On land (l) Other (0)

The dependent variable, P, was computed as the $amount of taxes paid and, alternatively, as taxes per $100. Both forms of P represent the same idea, so we report the results principally as the $amount of taxes, using the rate form as an aid in interpretation. Regressivity, then, is an increase in taxes paid, but proportionately less than the increase in the value of landholdings. Progressivity is a more than proportionate, and neutrality a proportionate, increase in taxes associated with an increase in value of landholdings.

What determines the amount of real property taxes paid? The obvious answer for an *ad valorem* tax, on a market value-based assessment, is the value of the property. The focus variable, therefore, is X_1, value of the landholding. However, for a U.S. estimate, State differences in the role and methods of taxation must be accounted for, so a single index of those differences was embodied in X_2, the State average of real property tax rates. Later, a regression was run for each of the States without X_2 (see below). The remaining variables, X_3-X_7, were considered as possible influences that could systematically affect the level of taxation. To accommodate personal characteristics, the data set for the regression was constrained to individuals and partnerships (applies to the principal partner).

Age is given some preference in some States, under varying circumstances, so the net effect could be some downward pressure on whatever size classes the older owners affected most. In general, the rates for operators and nonoperators appeared to move in opposite directions on age, so an analysis carrying both variables could sort the separate from the interactive effects. Older owners could be either more or less successful in challenging their assessments. These and other arguments offered reasons why older taxpayers might pay higher or lower taxes. In the regression, the age coefficient X_3 in relation to taxes paid was positive, but, with $t < 2$, was deemed not significant.

Although operators on average had more valuable properties, nonoperators paid higher taxes per acre and per $100 of value. Perhaps the tax system has a systematic bias for higher taxes on nonoperator property. The rationale for the difference was not obvious, but the empirical evidence warranted inclusion of operator/nonoperator status in the equation. Race was included largely on historical grounds, although the present landholdings of nonwhites is such a small percentage of total holdings that property tax differences seemed inconsequential. Occupation and, to some extent, residence are additional dimensions of the operator/nonoperator status. These three variables reflect the participation in use, as well as investment in, farmland. In the equation, X_4-X_7 were discrete (O,1) variables.

Results of the overall U.S. model were:

$$\$P = [\text{Intercept } -6.08] + 0.0034\ X_1 + 1{,}285.00\ X_2 + 4.75\ X_3 + 138.55\ X_4 + -106.55\ X_5 + 489.20\ X_6 + -101.84\ X_7.$$

The coefficient of X_1 tells us that, all other variables remaining the same, taxes will increase 0.0034 for each dollar that the value of farmland landholdings increases. Taxes rise, but only at about one-third the rate of a proportional tax (a 1-percent increase in value of property yields a 1-percent increase in taxes). An intuitive interpretation of X_2 is difficult because the average tax rate is essentially a scalar, values of which run from less than 0.4 to more than 2; the product of 1,285 and even a low State tax rate has substantial influence on the total real property tax paid, as we might reasonably expect. Age, X_3, is positively, but minimally, related to the size of the tax bill; the total tax bill for 10 years of aging is $47.50.

Because the dependent variable, $P, is the total taxes paid, it is the product of the tax rate and the value of the property. When the larger valued properties and lower tax rates of the X_4 operator owners are measured against the smaller valued properties and higher tax rates of the X_4 nonoperator owners, a regression coefficient of 138.55 was positive for operator owners. Owner operators, while paying a lower tax rate, pay $138.55 more than nonoperators because the value size of their properties tends to be larger. In the alternate form of the model with the dependent variable expressed as a tax rate rather than absolute value of taxes, the regression coefficient X_4 was -0.006, consistent with the observed lower tax rates paid by operator owners.

Race, X_5, was not statistically significant. Occupation, X_6, of the owner reported as "farmer," increases the tax bill, other variables remaining the same, by $489.20. Residence, X_7, reported as "on farm," has a negative $100 effect, but the *t* statistic suggests it is not significant. The low coefficient of determination, $R^2 = 0.12$, means the model is a poor predictor of the actual amount of farmland property taxes. Given the enormous variation in properties, tax levels, and tax administration in thousands of jurisdictions, the result is not unexpected.

Separate regressions were run on each State using the same variables, except the deleted State variable X_2. Four States--Wisconsin, Michigan, Kansas, and Nebraska--had X_1 coefficients that imply progressive rates. Another five States had neutral or slightly regressive rates. All others had regressive or steeply regressive rates.

Appendix table 1--Farm real estate value, rents, and real property taxes, by State, 1988

State	Value per acre	Gross cash rent/acre	Tax per acre	Net cash rent/acre	Ratio of tax to cash rent	Ratio of net rent to value
	----------*Dollars*----------					
United States	722	27.30	6.08	21.22	0.22	0.03
New England:						
Maine	921	43.18	10.88	32.30	0.25	0.04
New Hampshire	3,463	51.38	24.41	26.97	0.48	0.01
Vermont	1,197	32.56	13.82	18.74	0.42	0.02
Massachusetts	5,219	41.85	38.85	3.00	0.93	0.00
Rhode Island	6,117	52.13	44.91	7.22	0.86	0.00
Connecticut	7,456	47.56	31.67	15.89	0.67	0.00
Middle Atlantic:						
New York	1,210	30.75	19.18	11.57	0.62	0.01
New Jersey	7,456	64.43	39.51	24.92	0.61	0.00
Pennsylvania	1,884	41.18	14.19	26.99	0.34	0.01
East North Central:						
Ohio	1,209	57.61	11.35	46.26	0.20	0.04
Indiana	1,201	65.46	11.53	53.93	0.18	0.04
Illinois	1,406	68.96	15.21	53.75	0.22	0.04
Michigan	998	42.61	21.61	21.00	0.51	0.02
Wisconsin	817	40.64	17.50	23.14	0.43	0.03
West North Central:						
Minnesota	742	47.61	7.89	39.72	0.17	0.05
Iowa	1,184	79.68	14.53	65.15	0.18	0.06
Missouri	646	27.53	3.11	24.42	0.11	0.04
North Dakota	309	19.68	3.22	16.46	0.16	0.05
South Dakota	253	14.41	3.57	10.84	0.25	0.04
Nebraska	418	21.09	6.36	14.73	0.30	0.04
Kansas	408	16.81	5.55	11.26	0.33	0.03
South Atlantic:						
Delaware	2,092	58.33	9.12	49.21	0.16	0.02
Maryland	3,022	54.80	13.42	41.38	0.24	0.01
Virginia	1,293	34.04	6.95	27.09	0.20	0.02
West Virginia	676	19.28	2.28	17.00	0.12	0.03
North Carolina	1,417	53.58	9.21	44.37	0.17	0.03
South Carolina	981	35.39	4.58	30.81	0.13	0.03
Georgia	871	37.94	6.89	31.05	0.18	0.04
Florida	1,905	41.46	9.93	31.53	0.24	0.02
East South Central:						
Kentucky	936	46.64	3.53	43.11	0.08	0.05
Tennessee	1,057	44.04	4.99	39.05	0.11	0.04
Alabama	850	20.65	2.84	17.81	0.14	0.02
Mississippi	767	39.02	3.19	35.83	0.08	0.05
West South Central:						
Arkansas	797	49.87	6.27	43.60	0.13	0.05
Louisiana	889	39.39	4.09	35.30	0.10	0.04
Oklahoma	460	15.69	2.77	12.92	0.18	0.03
Texas	593	14.67	3.20	11.47	0.22	0.02
Mountain:						
Montana	223	10.58	1.92	8.66	0.18	0.04
Idaho	643	40.37	6.57	33.80	0.16	0.05
Wyoming	147	4.94	1.15	3.79	0.23	0.03
Colorado	421	8.14	2.49	5.65	0.31	0.01
New Mexico	152	3.56	0.55	3.01	0.15	0.02
Arizona	630	11.95	2.38	9.57	0.20	0.02
Utah	501	11.23	2.59	8.64	0.23	0.02
Nevada	433	2.82	2.17	0.65	0.77	0.00
Pacific:						
Washington	782	24.71	6.57	18.14	0.27	0.02
Oregon	697	29.75	7.81	21.94	0.26	0.03
California	2,214	45.00	12.61	32.39	0.28	0.01
Alaska	373	3.76	2.71	1.05	0.72	0.00
Hawaii	2,513	106.17	8.88	97.29	0.08	0.04

Appendix table 2--Farmland owners, acres, value, and tax rates, by State, 1988

State	All owners	Acres owned	Value	Taxes	Share of real property value	Share of real property taxes	Tax per acre	Tax per $100
			----------Dollars----------		-----Percent-----		-------Dollars-------	
United States	2,952,282	833,156,890	601,472,031,619	5,056,796,137	100.0	100.0	6.07	0.84
New England:								
Maine	7,831	1,300,388	1,197,775,168	13,909,226	0.2	0.3	10.70	1.16
New Hampshire	4,127	427,741	1,482,072,018	10,043,583	0.2	0.2	23.48	0.68
Vermont	5,458	1,332,709	1,595,056,007	18,225,587	0.3	0.4	13.68	1.14
Massachusetts	7,675	641,597	3,350,326,796	24,731,853	0.6	0.5	38.55	0.74
Rhode Island	658	44,523	275,263,546	1,886,647	0.0	0.0	42.37	0.69
Connecticut	5,612	424,758	3,168,904,275	12,390,647	0.5	0.2	29.17	0.39
Middle Atlantic:								
New York	60,374	8,185,761	9,904,468,349	162,426,622	1.6	3.2	19.84	1.64
New Jersey	10,389	846,440	6,307,933,970	32,568,779	1.0	0.6	38.48	0.52
Pennsylvania	77,398	7,062,069	13,302,771,396	102,886,880	2.2	2.0	14.57	0.77
East North Central:								
Ohio	116,216	14,247,910	17,218,827,084	158,415,881	2.9	3.1	11.12	0.92
Indiana	123,010	16,419,151	19,721,366,681	179,284,816	3.3	3.5	10.92	0.91
Illinois	173,191	28,621,792	40,252,721,309	428,469,095	6.7	8.5	14.97	1.06
Michigan	89,426	10,399,237	10,375,816,747	221,650,218	1.7	4.4	21.31	2.14
Wisconsin	111,091	17,752,096	14,495,683,472	318,553,583	2.4	6.3	17.94	2.20
West North Central:								
Minnesota	124,471	28,110,311	20,863,835,721	218,546,929	3.5	4.3	7.77	1.05
Iowa	132,840	27,417,193	32,450,746,337	390,694,679	5.4	7.7	14.25	1.20
Missouri	134,824	30,289,846	19,563,969,048	93,567,587	3.3	1.9	3.09	0.48
North Dakota	59,976	41,307,933	12,770,371,329	113,722,849	2.1	2.2	2.75	0.89
South Dakota	57,121	35,454,992	8,985,439,157	127,684,116	1.5	2.5	3.60	1.42
Nebraska	74,652	40,719,412	17,037,444,123	258,198,261	2.8	5.1	6.34	1.52
Kansas	124,941	51,980,672	21,201,284,565	265,549,301	3.5	5.3	5.11	1.25
South Atlantic:								
Delaware	5,359	488,502	1,022,775,971	4,241,563	0.2	0.1	8.68	0.41
Maryland	21,391	2,194,462	6,629,958,021	29,999,678	1.1	0.6	13.67	0.45
Virginia	59,651	8,448,613	10,924,823,521	57,240,100	1.8	1.1	6.78	0.52
West Virginia	18,395	3,051,448	2,061,823,576	6,933,593	0.3	0.1	2.27	0.34
North Carolina	105,256	9,085,158	12,877,394,027	80,251,115	2.1	1.6	8.83	0.62
South Carolina	34,796	4,893,238	4,799,610,126	21,101,720	0.8	0.4	4.31	0.44
Georgia	51,108	9,351,011	8,147,848,948	62,893,533	1.4	1.2	6.73	0.77
Florida	37,094	10,533,420	20,060,436,465	97,667,516	3.3	1.9	9.27	0.49
East South Central:								
Kentucky	110,520	13,810,483	12,924,133,775	47,834,773	2.1	0.9	3.46	0.37
Tennessee	83,298	10,377,324	10,972,940,290	50,140,334	1.8	1.0	4.83	0.46
Alabama	57,920	8,575,717	7,291,472,570	22,521,933	1.2	0.4	2.63	0.31
Mississippi	48,307	9,073,601	6,960,200,811	28,843,123	1.2	0.6	3.18	0.41
West South Central:								
Arkansas	57,028	12,053,953	9,604,131,823	70,570,386	1.6	1.4	5.85	0.73
Louisiana	35,908	7,493,013	6,658,033,745	25,955,008	1.1	0.5	3.46	0.39
Oklahoma	114,437	28,909,781	13,294,608,708	76,599,802	2.2	1.5	2.65	0.58
Texas	286,284	119,853,020	71,106,551,708	412,972,991	11.8	8.2	3.45	0.58
Mountain:								
Montana	32,052	42,014,061	9,377,380,497	78,492,822	1.6	1.6	1.87	0.84
Idaho	35,868	12,107,308	7,789,785,262	81,267,198	1.3	1.6	6.71	1.04
Wyoming	11,459	22,840,497	3,360,945,456	24,944,073	0.6	0.5	1.09	0.74
Colorado	34,359	33,133,872	13,936,848,200	94,968,561	2.3	1.9	2.87	0.68
New Mexico	14,016	35,633,293	5,414,432,929	19,651,724	0.9	0.4	0.55	0.36
Arizona	6,368	8,245,673	5,195,411,523	20,214,758	0.9	0.4	2.45	0.39
Utah	18,393	6,803,104	3,409,538,611	15,835,487	0.6	0.3	2.33	0.46
Nevada	3,516	2,540,338	1,100,933,376	4,899,230	0.2	0.1	1.93	0.45
Pacific:								
Washington	38,023	12,866,204	10,060,511,396	82,786,074	1.7	1.6	6.43	0.82
Oregon	41,913	11,822,764	8,236,929,949	93,890,853	1.4	1.9	7.94	1.14
California	82,785	22,572,789	49,974,450,883	281,621,612	8.3	5.6	12.48	0.56
Alaska	588	353,628	132,005,273	960,988	0.0	0.0	2.72	0.73
Hawaii	4,909	1,044,084	2,624,037,081	8,088,450	0.4	0.2	7.75	0.31

Appendix table 3--Real property taxes on operator and nonoperator land, by State, 1988

State	Operator owner		Nonoperator owner	
	Tax per acre	Tax per $100	Tax per acre	Tax per $100
	Dollars			
United States	5.98	0.79	6.20	0.92
New England:				
Maine	10.59	1.14	11.12	1.26
New Hampshire	24.55	1.04	20.24	0.30
Vermont	13.45	1.13	16.25	1.23
Massachusetts	41.17	0.75	26.90	0.66
Rhode Island	44.62	0.74	38.75	0.60
Connecticut	32.83	0.40	24.56	0.38
Middle Atlantic:				
New York	20.49	1.69	17.92	1.50
New Jersey	43.18	0.58	30.57	0.41
Pennsylvania	13.16	0.80	17.15	0.74
East North Central:				
Ohio	11.23	0.95	10.97	0.89
Indiana	11.35	0.89	10.51	0.92
Illinois	15.14	1.12	14.88	1.04
Michigan	20.59	2.01	22.35	2.32
Wisconsin	16.99	2.05	19.83	2.49
West North Central:				
Minnesota	7.25	0.96	8.49	1.18
Iowa	14.65	1.35	13.89	1.09
Missouri	2.89	0.44	3.50	0.56
North Dakota	2.53	0.73	3.00	1.13
South Dakota	3.40	1.37	3.95	1.49
Nebraska	6.01	1.52	6.75	1.51
Kansas	5.39	1.26	4.78	1.24
South Atlantic:				
Delaware	10.26	0.43	7.49	0.40
Maryland	15.78	0.49	10.83	0.39
Virginia	6.82	0.50	6.67	0.60
West Virginia	2.23	0.33	2.40	0.35
North Carolina	10.58	0.66	7.33	0.58
South Carolina	4.59	0.43	3.90	0.45
Georgia	6.45	0.73	7.51	0.92
Florida	8.22	0.41	13.48	0.86
East South Central:				
Kentucky	3.52	0.38	3.27	0.33
Tennessee	4.87	0.45	4.74	0.48
Alabama	2.65	0.29	2.58	0.35
Mississippi	3.00	0.38	3.50	0.50
West South Central:				
Arkansas	7.83	0.93	4.23	0.56
Louisiana	4.26	0.41	2.70	0.36
Oklahoma	2.85	0.55	2.38	0.63
Texas	3.57	0.49	3.32	0.74
Mountain:				
Montana	1.84	0.81	1.97	0.93
Idaho	6.64	1.04	6.84	1.04
Wyoming	1.04	0.70	1.21	0.86
Colorado	2.28	0.67	4.04	0.69
New Mexico	0.69	0.42	0.23	0.19
Arizona	2.96	0.46	1.60	0.26
Utah	2.47	0.46	2.00	0.46
Nevada	3.43	0.47	0.81	0.39
Pacific:				
Washington	9.97	0.83	3.72	0.80
Oregon	8.28	1.17	7.34	1.08
California	16.31	0.55	7.06	0.62
Alaska	7.27	0.75	1.12	0.69
Hawaii	9.61	0.43	5.09	0.18